In the Claims:

Please amend claims 31, 37, and 40. Claims 1-10 and 31-40 are thus pending after entry of the amendment. The claim amendments are intended to expedite prosecution, are not related to patentability, and are presented to correct typographical and form matters.

To satisfy the requirements of 37 CFR 1.121(c) and 37 CFR 1.52(a), all pending claims, whether or not amended, are presented below. A marked-up version of the amended claims showing the changes made to the amended claims follows the Remarks section of this Response.

B

Pending Claims 1-30:

1. A method of generating a computer-based 3D (three-dimensional) model for a patient's anatomical part comprising:

defining a 3D template model for the patient's anatomical part;

receiving a plurality of 2D (two-dimensional) X-ray images of the patient's anatomical part:

extracting 2D fiducial geometry of the patient's anatomical part from each of said plurality of 2D X-ray images; and

deforming the 3D template model using the 2D fiducial geometry of the patient's anatomical part so as to minimize an error between contours of the patient's anatomical part and those of the deformed 3D template model.

2. The method of claim 1, wherein defining the 3D template model includes selecting the 3D template model from a set of 3D template models stored in an electronic database.
3. The method of claim 1, wherein receiving the plurality of 2D X-ray images includes receiving said each of the plurality of 2D X-ray images in a digitized form.
4. The method of claim 1, wherein receiving the plurality of 2D X-ray images includes: generating the plurality of 2D X-ray images of the patient's anatomical part; and digitizing said each of the plurality of 2D X-ray images.
5. The method of claim 1, wherein the patient's anatomical part is a bone.
6. The method of claim 1, wherein extracting 2D fiducial geometry includes detecting surface contours of the patient's anatomical part from said each of the plurality of 2D X-ray images.
7. The method of claim 1, wherein deforming the 3D template model includes:

identifying the 2D fiducial geometry of the patient's anatomical part on the 3D template model therefor;

embedding the 3D template model into a 3D lattice; and

deforming the 3D lattice until a projection error between one of the plurality of 2D X-ray images and a corresponding view of the 3D template model projected thereon is minimized.

8. The method of claim 7, wherein deforming the 3D lattice includes:
computing a plurality of free form deformation (FFD) parameters for the 3D lattice; and
optimizing values for the plurality of FFD parameters so as to minimize the error between the contours of the patient's anatomical part and those of the deformed 3D template model.

9. The method of claim 7, wherein the 3D lattice is constituted of a plurality of parallelpipeds.

10. The method of claim 1, wherein said each of said plurality of 2D X-ray images is contained in a plane that is orthogonal to the planes containing the remainder of said plurality of 2D X-ray images.

11 ~~31.~~ (once amended) A method of creating a 3D (three-dimensional) model of a bone, comprising:
extracting a bone contour from a plurality of 2D (two-dimensional) X-ray images;
identifying the bone contour on a 3D template bone model;
adjusting a size and position of the template bone model based on the bone contour; and,
minimizing the differences between the adjusted template bone model and the X-ray images.

12 ~~32.~~ The method of claim ~~31~~ 11, further comprising creating a surgical plan based on the template bone model.

13 ~~33.~~ The method of claim ~~31~~ 11, wherein minimizing differences includes minimizing differences based on a plurality of free form deformation parameters.

14 ~~34.~~ The method of claim ~~31~~ 11, wherein adjusting a size and position of the template bone model includes adjusting size and position of the template bone model until they are optimum.

15 ~~35.~~ The method of claim ~~31~~ 11, further comprising accepting the plurality of X-ray images in digital format.

16 ~~36.~~ The method of claim ~~31~~ 11, further comprising accepting a position of a camera.

17 ~~37.~~ (once amended) A system, comprising:
a 3D (three-dimensional) template geometry database having stored therein at least one 3D template bone model; and,

a 3D geometry reconstructor module;

wherein the reconstructor module creates a 3D model of a bone by:

extracting a bone contour from a plurality of 2D (two-dimensional) X-ray images;

identifying the bone contour on a 3D template bone model;

adjusting a size and position of the template bone model based on the bone contour; and,

minimizing the differences between the adjusted template bone model and the X-ray images.

38. A system of claim 37, wherein the geometry reconstructor module is further for accepting the plurality of X-ray images in digital format.

39. A system of claim 37, further comprising a deformation mode database.

40. A 3D (three dimensional) geometry reconstructor, comprising:

means for extracting a bone contour from a plurality of 2D (two-dimensional) X-ray images;

means for identifying the bone contour on a 3D template bone model;

means for adjusting a size and position of the template bone model based on the bone contour; and,

means for minimizing the differences between the adjusted template bone model and the X-ray images.